

Claims

1. A diffuser which includes a cylinder open at one end and closed at the opposite end, the open end of the cylinder being securable to air supply; the wall of the diffuser being formed with a plurality of holes therethrough, each hole having a larger diameter on the exterior of the wall of the diffuser than on the interior of the wall of the diffuser; the longitudinal axis of each hole being inclined at an acute angle to both the radius and the longitudinal axis of the diffuser, and the orientation of each hole with respect to the longitudinal axis of the diffuser being such that when the diffuser is rotated about its longitudinal axis in use, the leading edge of each hole is at a higher elevation than the trailing edge of each hole.
2. The diffuser as claimed in claim 1, wherein each of said holes is circular in plan.
3. The diffuser as claimed in claim 1, wherein each of said holes is elliptical in plan.
4. The diffuser as claimed in any one of the preceding claims, wherein the sum of the areas of the interior ends of the holes is approximately equal to four times the cross-sectional area of the drive shaft.
5. The diffuser as claimed in any one of the preceding claims wherein the angles of inclination of each hole to the radius and to the longitudinal axis of the diffuser are approximately equal to the resultant angle of the combined velocity of fluid going past the diffuser and the rotation of the diffuser, in use.
6. The diffuser as claimed in claim 3, wherein the diffuser is made of sheet metal formed to a "cheese grater" design.
7. The diffuser as claimed in any one of the preceding claims in which the external surface of the closed end of the diffuser is provided with a nacelle having a smoothly rounded aerodynamic external shape.
8. The diffuser as claimed in any one of the preceding claims in which the internal

surface of the closed end of the diffuser is provided with a turning vane which provides a smoothly curved shape to minimise turbulence of air impacting thereon.

9. An aerator/mixer which includes:
- 5 a rotatable hollow drive shaft with at least one air intake port at or adjacent one end thereof and a propeller mounted adjacent the other end thereof so as to be rotatable with the drive shaft;
- means for rotating the drive shaft and the propeller;
- means for supplying air at above atmospheric pressure to the or each said intake
- 10 port;
- an air permeable diffuser as claimed in any one of claims 1-8, mounted on said other end of the drive shaft, the diffuser being further from said one end of the drive shaft than said propeller;
- the open end of the cylinder being in communication with the interior of said hollow
- 15 drive shaft such that air supplied to the or each said intake port can exit from the other end of the drive shaft only through the holes in the wall of the diffuser.
10. The aerator/mixer as claimed in claim 9 further including a stationary housing which surrounds a major portion of said drive shaft and which provides a housing
- 20 inlet port aligned with the drive shaft air intake port; and wherein said means for supplying air at above atmospheric pressure includes a pipe connectable between a source of pressurised air and said housing inlet port; the interior surface of said housing being formed with a pair of spaced, angled circumferential vanes which are aligned with the edges of said housing inlet port so as to form an annular air
- 25 plenum around the drive shaft air intake port.
11. The aerator/mixer as claimed in claim 10 wherein the circumferential vane closest to the propeller is formed with an annular collar which surrounds the adjacent
- 30 portion of the drive shaft and is spaced from the exterior surface of the drive shaft by a minimum operating clearance.